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AUTHOR Buddin, David
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ABSTRACT

An instructor's manual and student activity guide on the cotton boll are provided in this set of prevocational education materials which focuses on the vocational area of trade and industry (textiles). (This set of materials is one of ninety-two prevocational education sets arranged around a cluster of seven vocational offerings: agriculture, home economics, distributive education, health occupations, world of work, trade and industry, and office occupations.) The instructor's guide is organized into the following elements: title of activity, duration of activity (two to eight periods), activity goals, five instructional objectives, related vocational clusters, and activity implementation (description, materials needed, safety considerations, teacher preparation prior to class, during the class, follow-up activities, and a student question sheet to be duplicated). The student activity guide provides step-by-step instructions (narrative and illustrations) for completing each instructional objective (e.g., pick the reed and chaff from the cotton boll, twist the strands of fiber into one long strand). At the end of each set of instructions is a student check point (evaluation activity). Fourteen occupational descriptions (e.g., card tender, skein winder, weaver, knitting machine operator) conclude the document. (JH)

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ED169348

T & I – TEXTILES, COTTON BOLL

Kit No. 59

INSTRUCTOR'S MANUAL

Prepared by

David Buddin
McDuffie High School
Anderson, South Carolina 29621

State Department of Education
Office of Vocational Education
Prevocational Education
Columbia, South Carolina 29201

In Cooperation With

Vocational Education Media Center
Clemson University
Clemson, South Carolina 29631

1978

CE 020 533

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TITLE OF ACTIVITY

Kit No. 59, T & I – Textiles, Cotton Boll

DURATION

Main Activity: 1 – 3 periods
Follow-up Activity: 1 – 5 periods

GOALS

The student will understand the process used for refining cotton.

The student will transform a boll of cotton into yarn.

The student will become familiar with some of the occupations of the textile industry.

INSTRUCTIONAL OBJECTIVES

The student will pick the seed and chaff from the cotton boll.

The student will wash the cotton fiber in a cleaning solution.

The student will comb the cotton fiber.

The student will twist the short strands of fiber into one long, continuous strand.

The student will coil the yarn onto a spool.

VOCATIONAL CLUSTERS

Agriculture

ACTIVITY IMPLEMENTATION

A. Activity Description

The student will take a boll of cotton and transform it into a continuous strand of cotton yarn. The process will be done by hand but will follow the same operations as would be done in a textile plant.

B. Safety

Caution should be taken when using the paint thinner because it is flammable.

Dispose of paper towels at the end of the day or class period.

C. Materials Required

1. Audio Visual Equipment:

   None

2. Technical Equipment:

   25 combs
   1 metal pan
   1 funnel
   26 blocks of wood

3. Expendable Materials:

   25 empty toilet paper rolls
   25 cotton bolls
   1 pt. paint thinner
   1 pkg. paper towels
   1 jar rubber cement
   3 sheets 3/0 abrasive paper

D. Preparation Prior to Class

Cut the sheets of abrasive paper into nine pieces that are 3" x 3" (7.6 x 7.6 cm). Using rubber cement, glue these to the blocks of wood. Place the blocks in a central location.

Set up an area for the cleaning of the cotton fiber. In this area place the following:

1 tray
1 pt. paint thinner
1 pkg. paper towels
1 funnel

Have each student bring an empty toilet paper roll prior to the activity.

E. During Class Session

To each student, give a cotton boll and a comb.

Assist students only when called upon.

Remove abrasive paper from blocks of wood at the end of the activity.

F. Follow-up Activities

1. Have each student fill out a VIEW Fact Sheet.
2. Visit a textile plant.
3. Look for job openings in the textile field using the want ads.
4. Have a personnel manager from a textile plant come and talk to the class.
5. Visit a textile course at the area vocational center.

ANSWER KEY

None

MASTERS FOR DUPLICATION

VIEW Fact Sheet

VIEW FACT SHEET

NAME _____ CLASS _____ OCCUPATION _____

A. List the advantages (good points) of this occupation (job).

B. List the disadvantages (bad points) of this occupation (job).

C. List three things you should know to do this occupation (job).
1.
2.
3.

D. What type of education should you get to be prepared (do) for this occupation (job)?

E. What courses must you take to go into this occupation (job)?

F. What do you think your future in this occupation (job) will be?

G. What wage can you expect in this occupation (job)?

H. What are the working hours of this occupation (job)?

I. To learn more about this occupation (job), write to:

J. Using a scale of 1 to 5, circle the number that measures your interest in this occupation (job) as a possible career.

I don't like it. 1 2 3 4 5 I like it.

C

T & I – TEXTILES, COTTON BOLL

Kit No. 59

STUDENT

LEARNING ACTIVITY GUIDE

Prepared by

David Buddin
McDuffie High School
Anderson, South Carolina 29621

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TEXTILES, COTTON BOLL

INTRODUCTION

Textiles is one of the largest industries in South Carolina. It employs a large number of people in a variety of jobs.

Training is required to operate the complex machines used for refining the cotton. These machines are expensive and usually large in size.

In this activity, you will take cotton in its raw form and change it into yarn. This will be done by hand, but you will follow the same steps that would be done if you were using machines.

GOALS

The student will understand the process used for refining cotton.

The student will transform a boll of cotton into yarn.

The student will become familiar with some of the occupations of the textile industry.

DIRECTIONS

Start by reading Instructional Objective I and then follow the steps to complete the objective.

Complete the checkpoint before going on to the next objective.

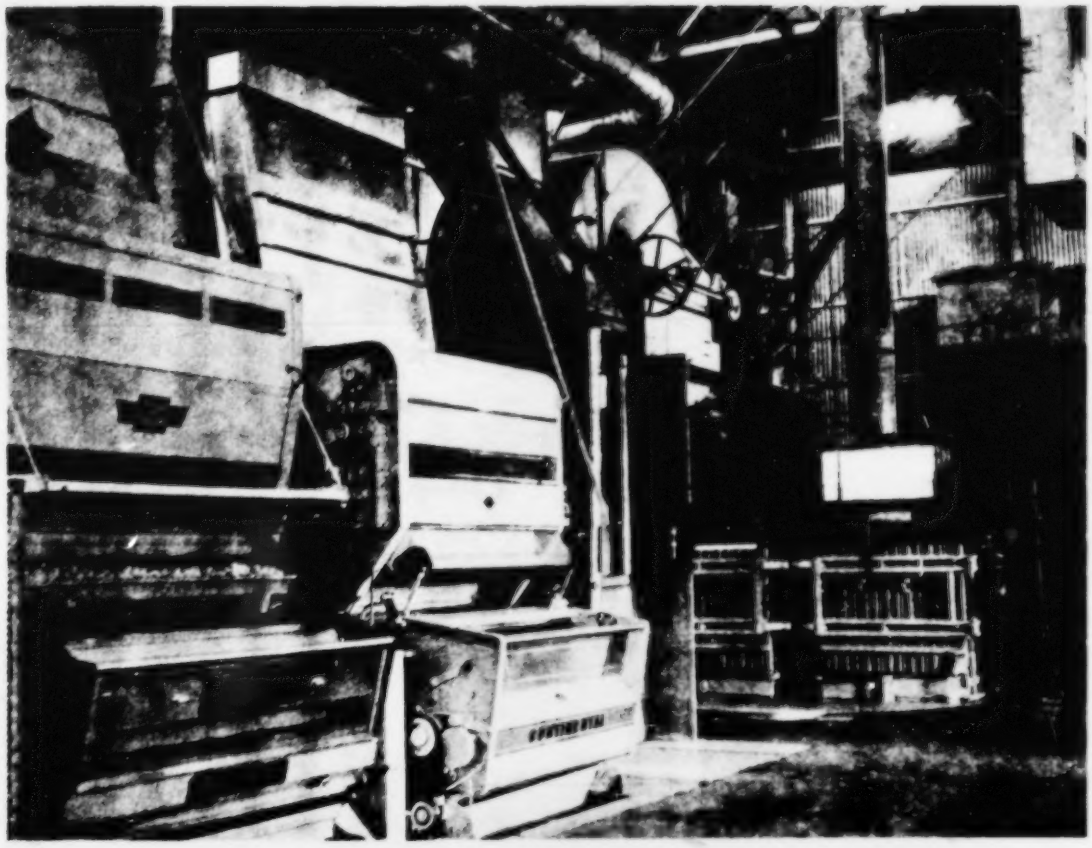
Do not make any marks in the programmed text.

MATERIALS

1 boll of cotton
1 empty toilet paper roll
1 comb
2 blocks of wood covered with sandpaper on one side

Instructional Objective 1

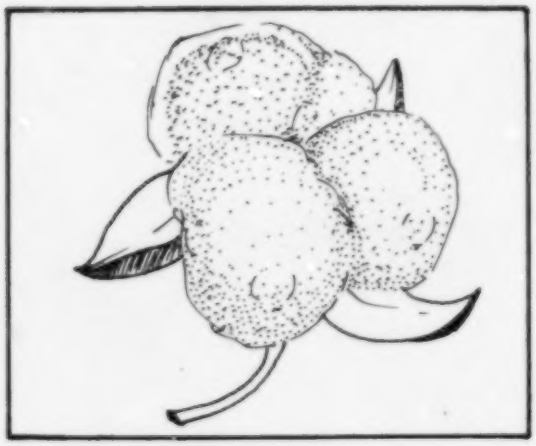
The student will pick the seed and chaff from the cotton boll.



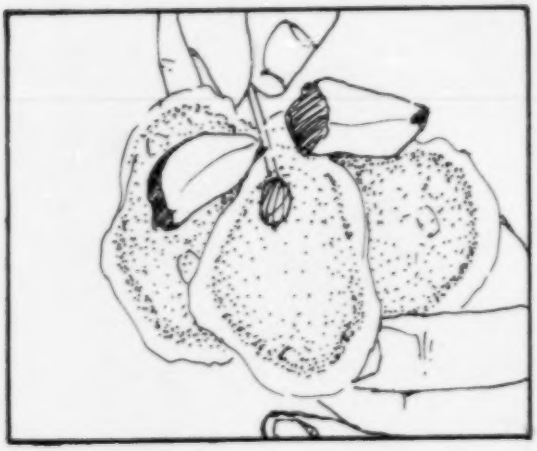
GINNING MACHINERY

Courtesy of the United States Department of Agriculture

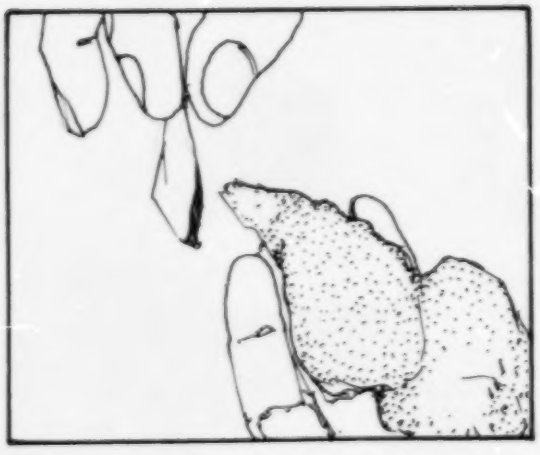
STEP 1 – In this first objective, you will perform the same operation as a gin. The gin removes the seed from the cotton boll.



STEP 2 – Obtain a boll of cotton.



STEP 3 – First, remove all of the seed from the boll.



STEP 4 – Next, remove the chaff from the boll.

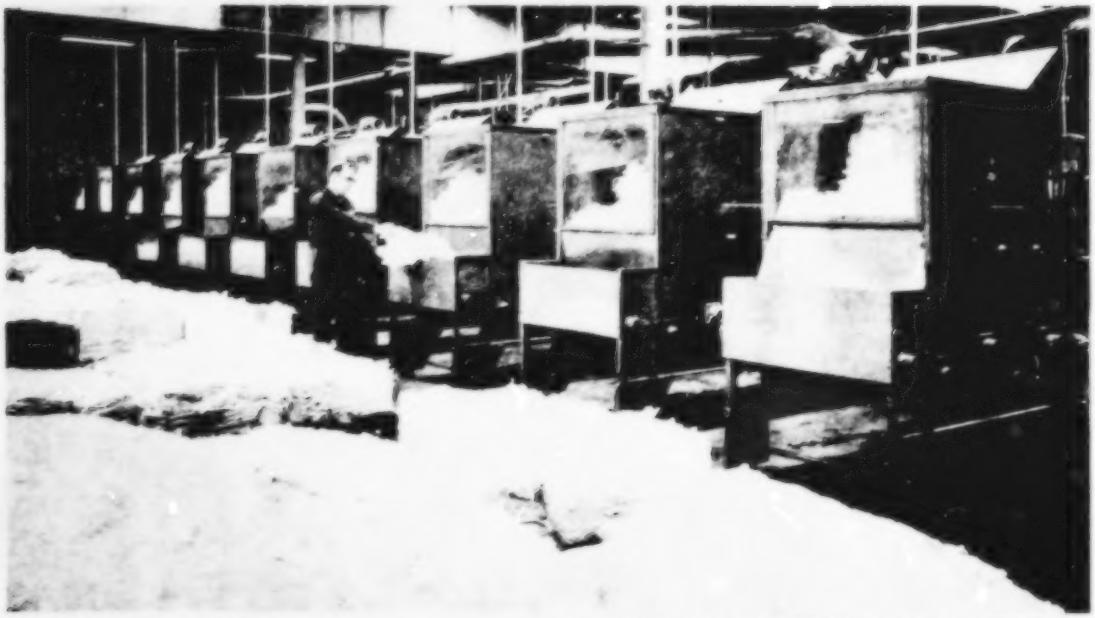
Check Point

Did you remove all of the seed?
Did you remove all of the chaff?

10

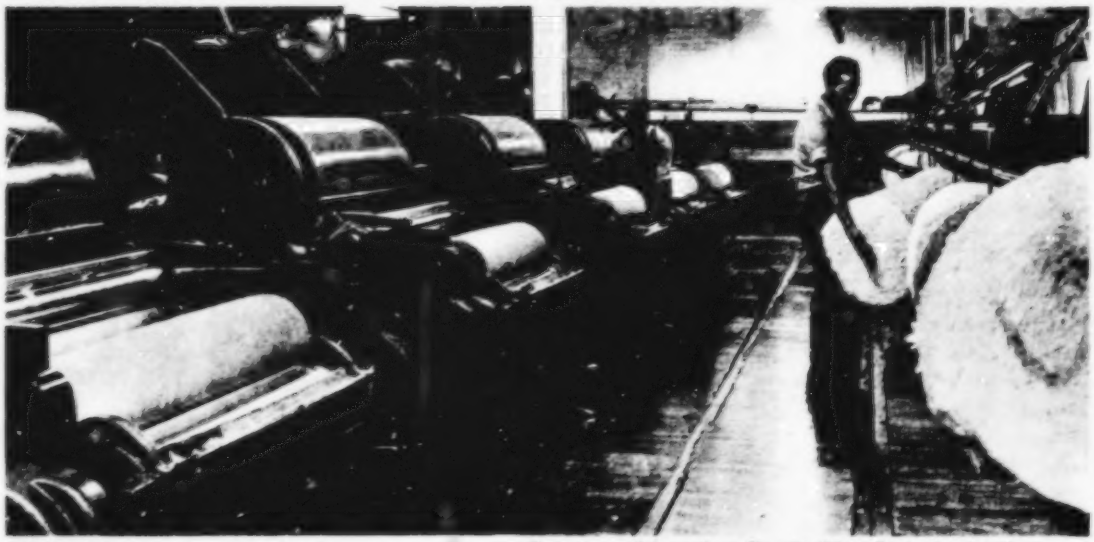
Instructional Objective II

The student will wash the cotton fiber in a cleaning solution.



OPENING AND BLENDING

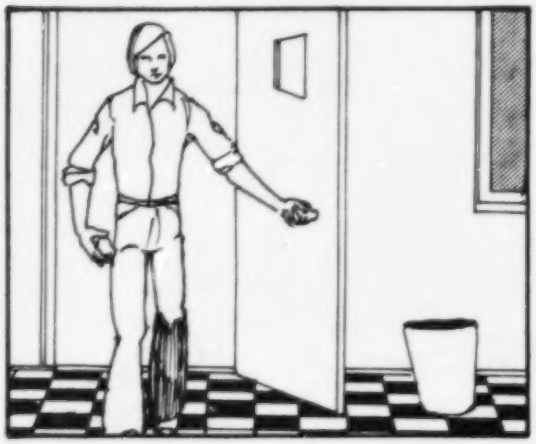
Courtesy of American Textile Manufacturing Institute



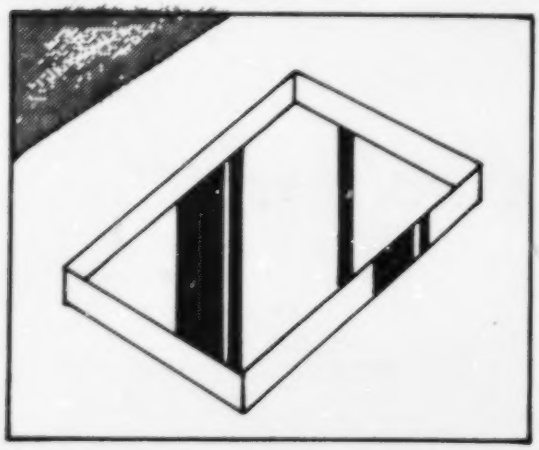
PICKING

Courtesy of American Textile Manufacturing Institute

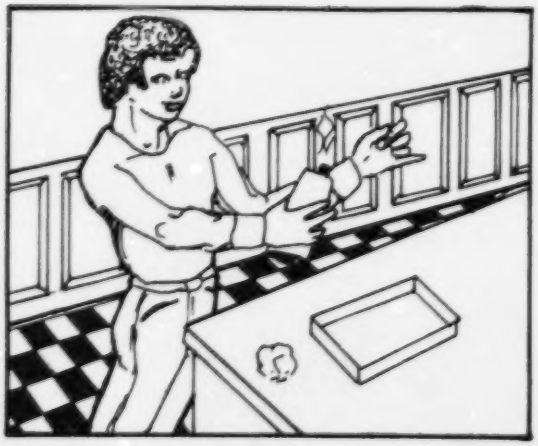
STEP 1 – In this objective, you will perform the operations that would be done by an opening machine and a picker machine. These machines do not use any type of liquid, however you will use a liquid in this classroom situation.



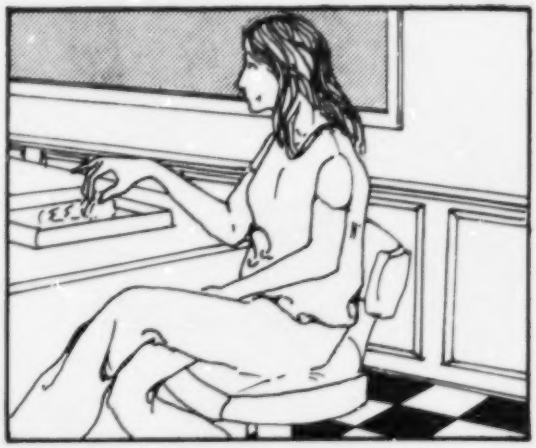
STEP 2 – Take your cotton fiber and go to the area your instructor has set up for cleaning the cotton fiber.



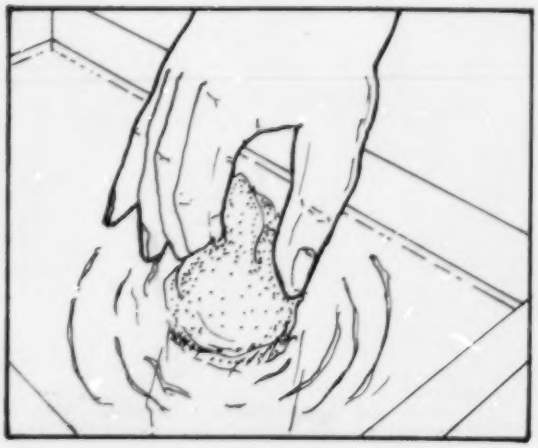
STEP 3 – Locate the tray that is to be used for cleaning.



STEP 4 – If it is empty, fill it with the cleaning solution (paint thinner).



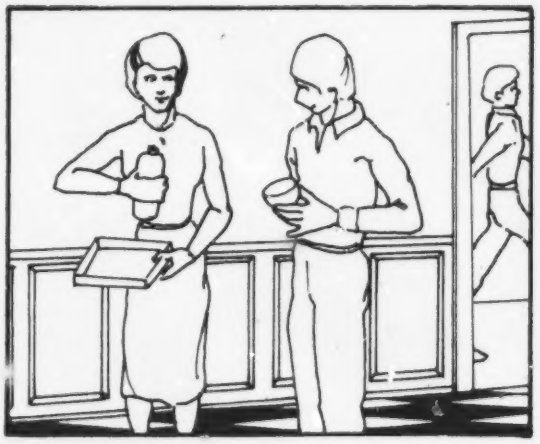
STEP 5 – Dip the cotton fiber into the cleaning solution.



STEP 6 – With your hand, gently move the cotton fiber back and forth in the cleaning solution.

STEP 7 – Obtain a couple of paper towels and spread them out in the work area.

STEP 8 – Place the cotton fiber on the paper towels to dry.



STEP 9 – If no one else is waiting to use the cleaning solution, pour it back into the container using a funnel, and close it.

STEP 10 – When the cotton fiber is dry, take it back to your work area.

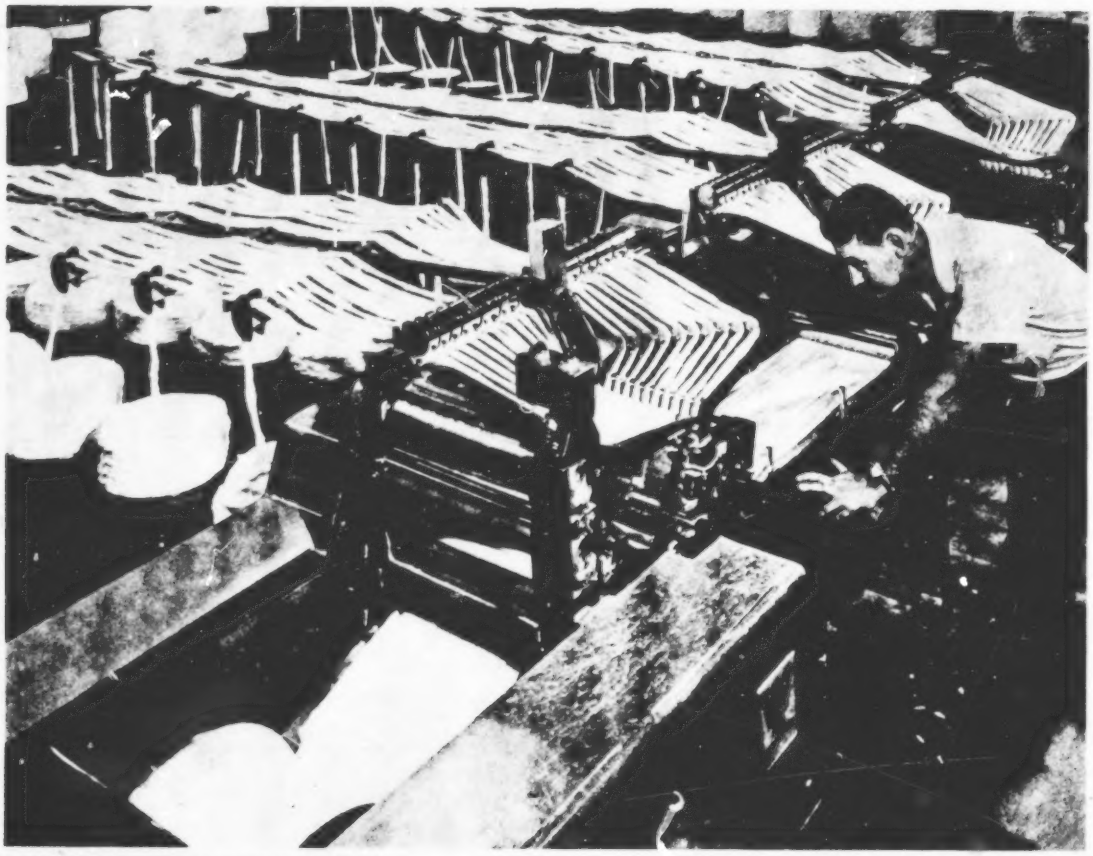
STEP 11 – Dispose of the paper towels in the container provided by your instructor.

Check Point

Did you clean the cotton fiber?
Did you allow the cotton fiber to dry?
Did you pour the cleaning solution back into the container?
Did you dispose of the paper towels?

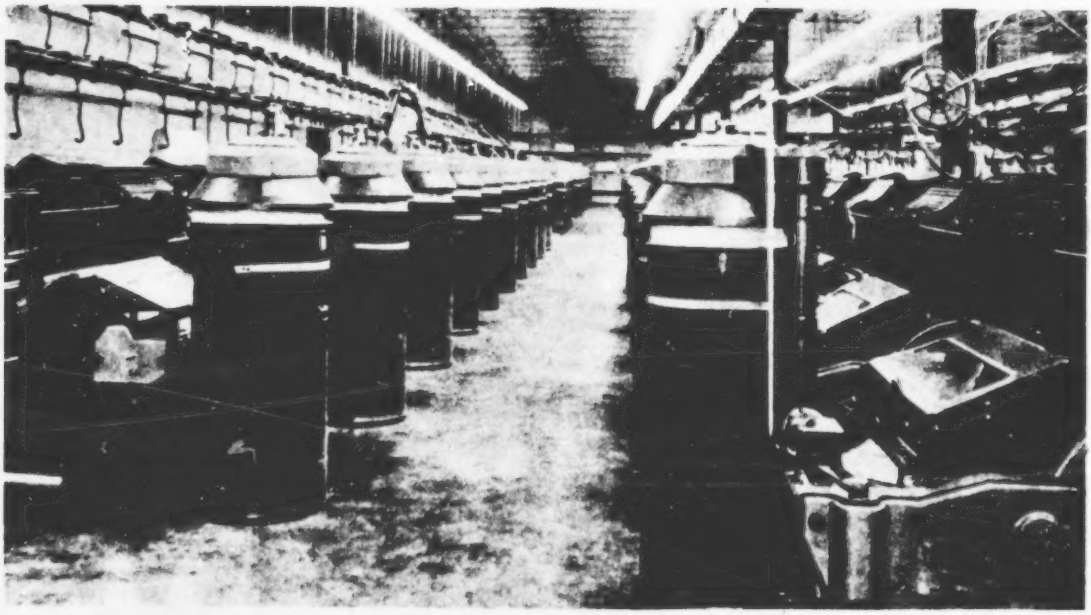
Instructional Objective III

The student will comb the cotton fiber.



COMBER PREPARATION MACHINE

Courtesy of American Textile Manufacturing Institute



REVOLVING FLAT CARDS

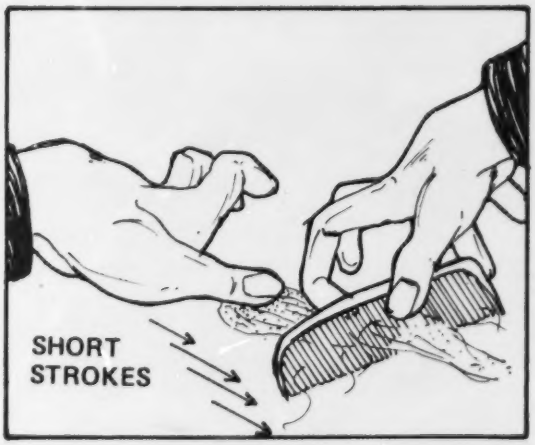
Courtesy of Crosrol

TWO DELIVERY DRAWING FRAMES **Courtesy of Saco-Lowell**

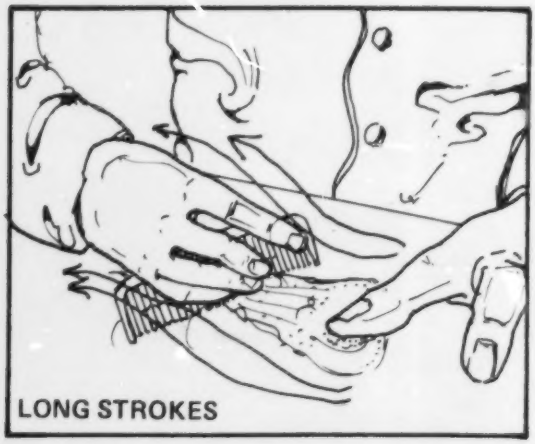
STEP 1 — In this objective, you will perform the operation that would be done by a card machine, a drawing frame, a ribbon lap machine, and a comber.

STEP 2 – Obtain a comb.

STEP 3 – Begin combing the fibers.



STEP 4 – Use short strokes first to help separate the fibers.



STEP 5 – Now use longer strokes and try to make the fibers parallel (going in the same direction).

Check Point

Did you start with short strokes?

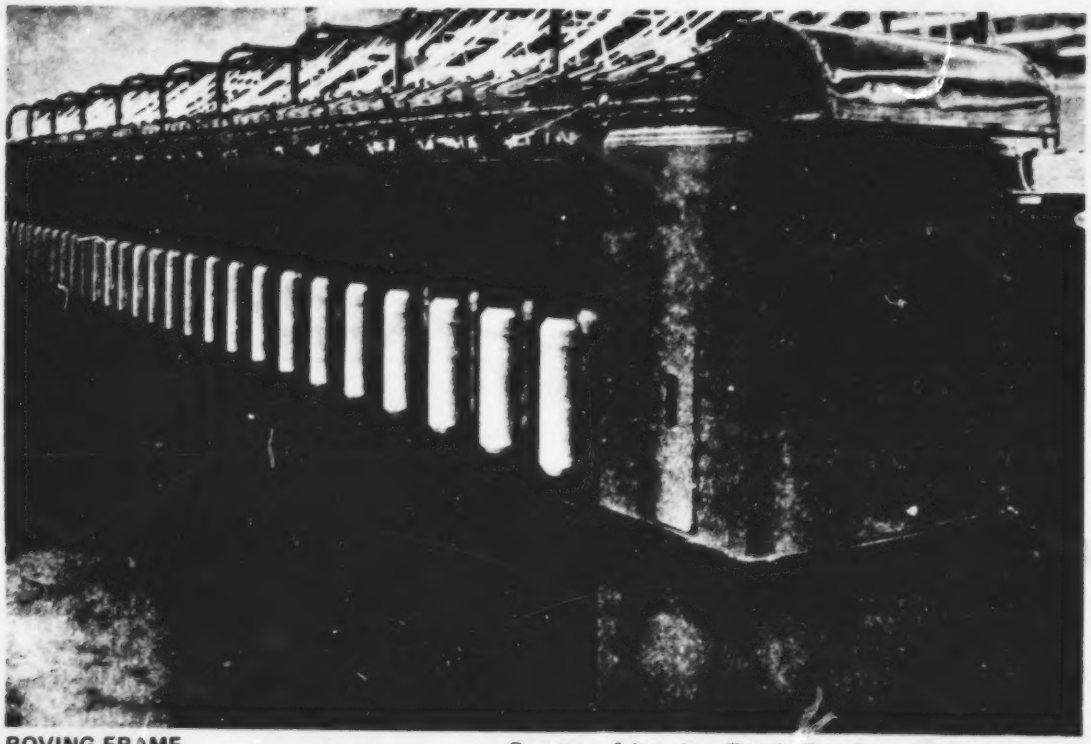
Did you use long strokes after the short strokes?

Are the fibers parallel?

16

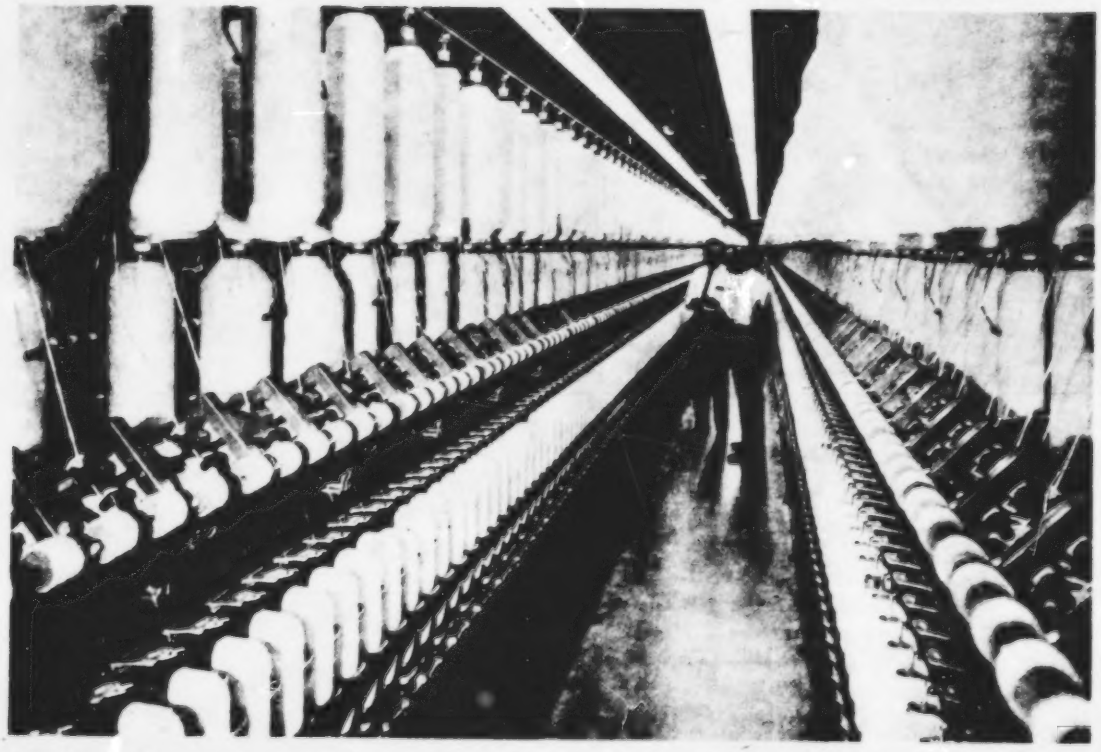
Instructional Objective IV

The student will twist the short strands of fiber into one long, continuous strand.



ROVING FRAME

Courtesy of American Textile Manufacturing Institute



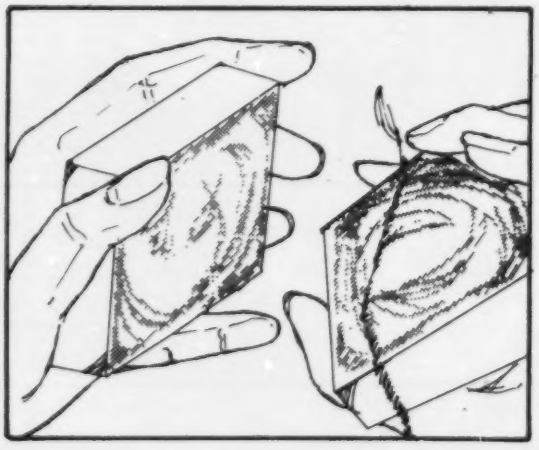
SPINNING FRAMES

Courtesy of American Textile Manufacturing Institute

STEP 1 -- In this objective, you will perform 17 the operation that would be done on a roving frame and a spinning frame.

STEP 2 – Obtain two blocks of wood that have abrasive paper on them.

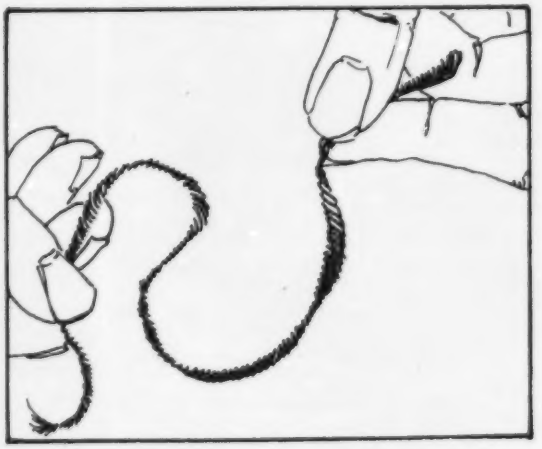
STEP 3 – Twist the short strands of fiber into one long continuous strand.



STEP 4 – Take the combed cotton fiber and place it between the blocks of wood. Make sure the two surfaces of abrasive paper are facing each other.

STEP 5 – Move the blocks so that the strand of fiber will roll between the two abrasive surfaces.

STEP 6 – This motion will produce a continuous strand of yarn.



STEP 7 – If the diameter of the strand is uneven, recomb the fiber and repeat the above steps.

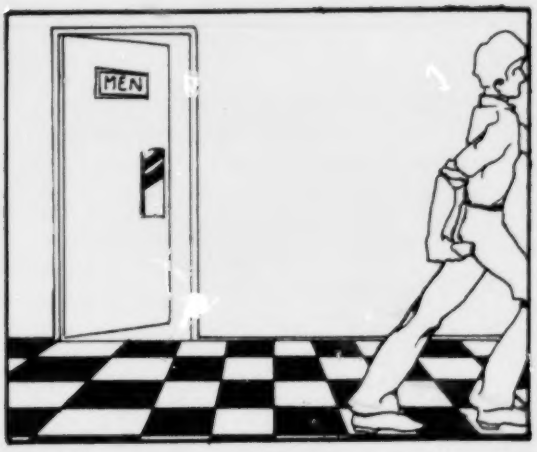
Check Point

Did you twist the short fibers into one long, continuous strand.

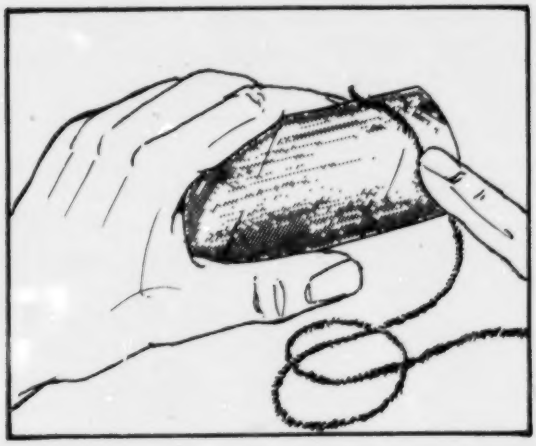
Is the diameter of your yarn even?

Instructional Objective V

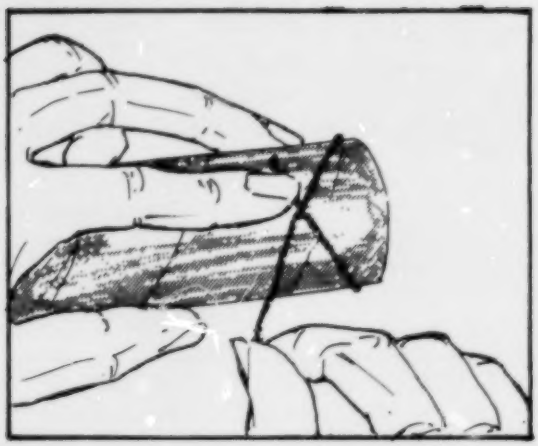
The student will coil the yarn onto a spool.



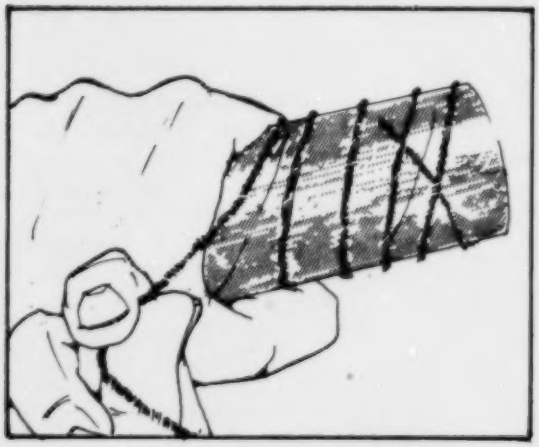
STEP 1 – Obtain an empty toilet paper roll.



STEP 2 – Place one end of the yarn near the end of the roll.



STEP 3 – Make one turn around the roll and cross over the end.



STEP 4 – Continue to coil the yarn onto the spool.

STEP 5 – You now have a spool of cotton yarn.

Check Point

Did you coil the yarn onto a spool?

20

680.685-018 CARD TENDER (asbestos prod.; textile) alley tender; card hand; card operator.

Tends carding machines that open, clean, and aline cotton, asbestos, or other fibers, and convert laps II of fibers into sliver: Feeds loose fibers onto feeder apron of machine, or mounts lap of fiber on bracket at feed end of machine and threads end of lap through feeder rollers or attaches end to lap in machine by pinching ends together with fingers. Patrols area to detect exhausted laps or sliver breaks. Pieces up broken sliver by rolling and twisting ends with fingers. Cleans machine, using brush, waste, and airhose. May oil machine. May replace full cans of sliver with empty cans. May truck laps from picker room and hang laps on stands of machines. May tend machines that produce sliver from raw stock. May strip cards [CARD STRIPPER (textile)].

680.685-038 DRAWING-FRAME TENDER (textile) drawer; drawing tender.

Tends drawing frames that combine several strands of sliver into one strand, distributing weight uniformly, and arranging fibers in parallel order: Pulls cans of sliver to creeling position. Threads end of sliver through guides, stop-motion device, drawing rollers, condenser, and coiler head, and into revolving can, or attaches sliver to preceding end by overlapping and twisting ends with fingers. Patrols machines to observe flow of sliver, and signal lights indicating machine stoppage caused by sliver break. Repairs breaks in sliver by matting and rolling broken ends together between thumb and fingers. Replaces filled cans of sliver from coiler head with empty cans. Cleans rollers with airhose. May oil machine.

680.685-070 OPENER TENDER (textile) bale-breaker operator; breaker operator; opening-machine tender; stock blender.

Tends series of machines in tandem that open, clean, fluff, and mix compressed cotton or synthetic fibers preparatory to picking process: Starts machines and feeds layers of fibers from several bales into machine hoppers to produce uniform blend. Observes processing of fibers and signal lights to detect clogged beaters. Cleans and oils machines. May weigh fibers preparatory to feeding machines.

680.685-074 PICKER TENDER (textile) picker.

Tends battery of picker machines that break up and clean cotton or synthetic fibers, form them into lap II, and wind lap into rolls: Starts machine and pulls cord to open gate of hopper through which cotton tufts feed onto conveyor of machine or hand feeds cotton tufts onto conveyor. Moves levers to regulate weight, length of lap, and speed of machine. Observes and regulates speed of conveyor as it feeds machine to prevent jamming. Inserts pin in takeup position and turns end of lap around pin by hand. Lifts roll of lap from machine, weighs it, records weight, places roll on portable rack, and removes pin around which lap was wound. Cleans and oils machine.

680.685-094 SLIVER-LAP MACHINE TENDER (textile) carding doubler; lap regulator; lap-winding-machine operator.

Tends machines which combine strands of sliver (usually 12 or more) into lap II and winds it into rolls: Pulls cans of sliver to creeling position. Threads ends of sliver through guides, stop-motion device, and rolls, and onto takeup pin, or attaches end to preceding end by overlapping and twisting it with fingers. Patrols machine area to detect exhausted ends and observe lights indicating machine stoppage caused by sliver break. Pieces up broken ends. Depresses pedal to raise roll of lap for doffing or loosens holders by hand. Removes lap and replaces empty pins. May tend combers [COMBER TENDER (textile)] or ribbon lappers [RIBBON-LAP-MACHINE TENDER (textile)].

680.686-018 MACHINE FEEDER, RAW STOCK (felt goods; house furn.; textile; waste & batting) feeder tender; guillotine operator; hopper feeder; shredder picker.

Feeds raw fiber stock into machines that loosen, shred, separate, clean, form nubs, or straighten fibers: Places fibers on conveyor belt or into machine hopper for processing by machine. Opens and closes gates of belt and pneumatic conveyors on machines fed directly from preceding machines. Loosens material before dumping it into hoppers by pulling fibers apart. May truck stock from storage or other departments to machine. May

be designated according to type of machine fed as CARDING-MACHINE FEEDER (textile); GARNETT FEEDER (house furn.; waste & batting); NUB-CARD TENDER (textile); PICKER FEEDER (house furn.; textile).

681.685-098 SKEIN WINDER (textile) coner; spooler; swift tender.

Tends machine that simultaneously winds yarn from skeins onto spools or cones: Hangs skeins of yarn on rack and beats out (shakes or pulls) skeins to straighten yarn and facilitate winding. Inspects yarn to detect soil, color spots, or defective twisting and discards faulty skeins. Removes reel (swift) from machine, wraps skein of yarn around reel, and replaces reel. Cuts card holding yarn in place, using scissors. Threads end of yarn through guides and turns it around spool or cone and starts unit winding. Pieces up broken ends or ties new skeins with knotter. Observes winding operation and removes cones when full. Sets in empty cones. May be designated according to type of yarn wound as LASTEX-THREAD WINDER (textile).

681.685-150 WINDER OPERATOR, AUTOMATIC (textile)

Tends automatic yarn-winding machine, equipped with stationary knotter and traveling winding units that move around machine, to transfer yarn from bobbins to cones or tubes l: Places bobbins in pockets of feeder magazine and pulls ends of yarn over suction tube opening through which yarn is drawn into knotter. Doffs packages when light indicates package is filled. Replaces tubes or cones on spindles. Laps strands of yarn around cones or tubes to start yarn winding. Presses pedal or button to stop and control speed of machine, according to flow of work. Notifies MACHINE FIXER (textile) when malfunction occurs.

682.685-010 SPINNER, FRAME (asbestos prod.; textile) spinner; spinning-frame tender.

Tends spinning frame that draws out and twists roving or sliver into yarn: Patrols work area and observes spinning to detect nearly exhausted supply packages and breaks in yarn, roving, and sliver. Pieces up breaks in yarn, roving, and sliver and replaces nearly exhausted supply packages with full packages. Twists end of material from supply package to material in machine or threads material from supply package through machine guides and drawing rollers. Brushes yarn or lint from drawing rollers, guides, and rails, May doff machine [DOFFER (textile)]. May change travelers [TRAVELER CHANGER (textile)]. May be designated according to machine tended as SPINNER, CAP FRAME (textile); SPINNER, OPEN-END (textile); SPINNER, RING FRAME (textile).

683.682-038 WEAVER (asbestos prod.; textile) loom operator; weaver, broadloom.

Operates battery of looms to weave yarn into cloth: Observes cloth being woven to detect weaving defects. Removes defects in cloth by cutting and pulling out filling. Adjusts pattern chain to resume weaving. Examines looms to determine cause of loom stoppage, such as warp, filling, harness breaks, or mechanical defects. Ties piece of yarn to broken end and threads yarn through drop wires, heddle eyes, and reed dents to repair warp breaks, using hook. Pulls out broken filling and pushes shuttle through shed to insert new pick l and repair filling breaks. Notifies LOOM FIXER (asbestos prod.; narrow fabrics; textile) of mechanical defects. Marks or cuts cloth when sufficient yardage has been woven and notifies CLOTH DOFFER (textile). May place quills or bobbins in battery or magazine of loom [BATTERY LOADER (textile)]. May replace empty bobbins in shuttle with full ones on nonautomatic looms [SHUTTLE HAND (textile)]. May tend winding units attached to looms that wind filling onto quills [LOOM-WINDER TENDER (textile)]. May be designated according to type of loom operated as WEAVER, DOBBY LOOM (textile). When weaving samples, is known as SAMPLE WEAVER (textile).

683.686-010 BATTERY LOADER (textile) battery filler; battery hand; magazine filler.

Loads batteries or magazines of automatic looms with quills or bobbins of filling: Conveys quills or bobbins of filling to loom, using handtruck, and places them in battery or magazine of loom. Draws loose ends of filling through guides and winds ends around thread holder on side of battery or magazine.

685.665-014 KNITTING-MACHINE OPERATOR (knit goods) knitter: knitter, machine.

Tends one or more machines that knit fabrics, garment parts, or other articles from

yarn: Creels machine and ties end of yarn to yarn in machine or threads yarn through guides, tension springs, stop-motion devices, and yarn carrier or needles, using hook. Starts machine and laps end of knitted goods around takeup roller. Observes knitting to detect yarn breaks, exhausted yarn packages, and knitting defects. Ties broken yarn ends, replaces exhausted yarn packages, and notifies KNITTING-MACHINE FIXER (hosiery; knit goods) of mechanical defects. Cuts knitted fabric, using scissors, and doffs roll of cloth from machine. May mark ticket to indicate number of holes in knitted goods. May replace defective needles, using needle pliers or wrench. May weigh roll of knitted goods and record weight. May oil machine. May be designated according to type of machine tended as CIRCULAR KNITTER (knit goods); FLAT KNITTER (knit goods). May be designated according to type of fabric knitted as JERSEY KNITTER (knit goods); PILE-FABRIC KNITTER (knit goods); RIB-CLOTH KNITTER (knit goods), or garment part as COLLAR KNITTER (knit goods); CUFF KNITTER (knit goods).

685.687-010 CLOTH INSPECTOR (knit goods) assembler.

Examines cloth for knitting defects and rejects cloth not meeting specifications. Measures cloth and sews thread marker into material to indicate length required by specifications. Folds and ties inspected cloth with cord. Records routing information on paper and attaches paper to cloth. May mark knitting defects on cloth with chalk.

689.686-022 DOFFER (textile)

Doffs bobbins of yarn from spindles of spinning, twisting, or roving (slubber) frames: Stops machine and presses pedal to lower ring bar, allowing yarn to wind around base of spindle to facilitate restarting. Removes full bobbins of yarn from machine spindles, deposits yarn in handtruck, and replaces full bobbins with empty bobbins. Releases pedal to raise ring bar, starts machine, and pieces up breaks in roving or ties breaks in yarn ends. Applies grease or oil to rings, using finger or oilcan. May change travelers [TRAVELER CHANGER (textile)]. May brush waste from machine. May be designated according to machine doffed as SLUBBER DOFFER (textile); SPINNING DOFFER (textile); TWISTER DOFFER (textile).